Biobehavioral Prosem, Part 2: Behavioral Neuroscience  
(PSYC 303 A)  
Fall 2015 extended class

Professor:  
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Office hours: By appointment  

Meeting Time & Location:  
Dewey Hall 100  
Thursday mornings and evenings  

Course Description:  
Biobehavioral Prosem is designed to be an advanced survey and analysis of behavioral and biological psychology, with special emphasis on learning theory (Part 1) and behavioral neuroscience (Part 2). Behavioral neuroscience can be defined as “the study of how neural systems work together to produce behavior”. Some people use the term “behavioral neuroscience” to refer to the study of nervous system-behavior relations in non-human animals and “cognitive neuroscience” to refer to the study of nervous system-cognition-behavior relations in humans (and perhaps other primates). These are very loose distinctions and not universally agreed upon but you should be aware of them. In this part of Prosem, we will focus mostly on rodent work because rats and mice are the most commonly used species to study nervous system-behavior relations, but we will also talk about work in non-human primate. Course Objectives

You should leave this course with a basic understanding of research in behavioral neuroscience. By the end of this portion of Prosem, everyone should have some working knowledge of some of the approaches and questions in behavioral neuroscience. While it’s impossible to give you a full overview of behavioral neuroscience in only 5-6 weeks, you should get enough of an overview to support further exploration of these topics in our Biobehavioral seminars. It is also hoped that the topics we discuss will give you “food for thought” for how behavioral neuroscience-related approaches might contribute to your own area(s) of research interest.

Course Structure

Most meetings will be a mixture of lecture and discussion. Generally, I will lecture for about the first half of class. At this point, we’ll take a short break and then come back and spend the rest of class discussing the readings and how to write a ‘specific aims’ section of an NRSA grant. Reading for a particular class will be on blackboard a week before and should be read before coming to class.

Course Requirements

40% of your final grade: the writing of a NRSA NIH Grant-style Specific Aims Page: Due on Thursday, January 28th will be a two-sentence description of your
“Specific Aims” topic. I will give you feedback on this by the next class so you’ll have time to incorporate this feedback into your Specific Aims. I can be flexible on the topic you choose so that you can try to relate it to your own area(s) of research interest.

Format should be: 1” margins all around, 11 pt Arial font, single line spacing. This will likely start with a brief background and significance for human health, a short description of what you propose to study and why, and then 2-3 aims.

10% of your grade will be a peer review of one of your classmate’s specific aims page.

The other portion of your grade (40%) will be based on a short take home exam (about 2-3 pages of short essays answers) given out on the last day of Class (tentatively February 25th) based entirely on the class readings and due the next Monday AND class participation (10%), which means showing up to class and indicating that you have done the required reading.

Course Outline

NOTE: the articles should be read in the order specified for the optimal learning experience!

Readings will be available on the Blackboard course site

Week 1 – Introduction

Go over syllabus and discuss goals and requirements of this portion of the course. Lecture1 : Overview of basic neuroscience

Readings

- These two readings are meant to help you with your Specific Aims and are not for discussion in class

Lecture 2. How to put together a Specific Aims Page

Week 2 – Fear and Anxiety Circuits in the Brain
Readings (to be done before class: be prepared to discuss these in small groups and then with the class as a whole)


- **Role of the bed nucleus of the stria terminalis versus the amygdala in fear, stress, and anxiety** (2003) David L. Walker, Donna J. Toufexis, Michael Davis


  Brief lecture on fear and anxiety circuits if required by group

  Specific aims writing continued……..

**Week 3 – The Neurobiology of Addiction**

Brief Lecture on brain circuits involved in addiction

Readings (to be done before class: be prepared to discuss these in small groups and then with the class as a whole)


- **Sex differences in addictive disorders** (2014)
  Liana Fattore, Miriam Melis, Paola Fadda, Walter Fratta

  Specific aims writing continued……..

**Week 4– The Neurobiology of Stress**

Brief lecture on the Stress response

Readings (to be done before class: be prepared to discuss these in small groups and then with the class as a whole)

- **Resilience and vulnerability: a neurobiological perspective** (2013)
  Ilia N. Karatsoreos, Bruce S. McEwen

Movie on stress!!!!

**SPECIFIC AIMS PAGE DUE and given out to peer reviewers!**

**Week 5- The Neurobiology of Learning and Memory**
Readings (to be done before class: be prepared to discuss this in small groups and then with class as a whole)

- **Update on Memory Systems and Processes (2014)**
  L. Nadel, O. Hardt

**Peer review write-ups due and discussed in class**

**Week 6-Wrap-up- any left over business**
and take home exams given out- due the following Monday.